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A New Species of the Genus *Cletopsyllus* from  
Sagami Bay (Harpacticoida)\*

With 4 Text-figures

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**ABSTRACT** A new species of harpacticoid copepod, *Cletopsyllus sagamiensis* n. sp. (Family Normanellidae), is reported from Sagami Bay at a depth of about 80 m. The new species is distinguishable from the other species of the genus in the structure of the furcal rami. This is the first record of the family Normanellidae Nicholls from Japan.

Although four species of the genus *Cletopsyllus* Willey (Harpacticoida, Normanellidae) have been reported from several seas, it is known at the present that the species have been found upon rare occasions and the males are still unknown except for one species. The four species are: *C. papillifer* from Bermuda (Willey, 1935; 1 ♀), *C. secundus* from Port Denison, Western Australia (Nicholls, 1945; 1 ♀), *C. tertius* from Levantine, the Mediterranean Sea (Por, 1964; 1 ♀, 1 ♂) and from Elat, the Red Sea (Por, 1967; 2 ♀♀, 1 ♂♂), and *C. quartus* from Banyulus (Soyer, 1966; 1 ♀). No members belonging to the family Normanellidae Nicholls have so far been recorded from Japan.

In this paper, adding to the four species of the genus, one new species is described and illustrated on the basis of some specimens with both sexes from Sagami Bay. The specimens were collected on the KT 68-25 cruise of the R/V *Tansei Maru* of the Ocean Research Institute, University of Tokyo, on the days of Dec. 3-10, 1968. All the specimens examined are deposited in the Zoological Institute, Faculty of Science, Hokkaido University.

*Cletopsyllus sagamiensis* n. sp.

*Female* (Figs. 1-1 and 2). Body about 1.6 mm in length, rostrum included and furcal setae excluded. Nauplius eye present. Body elongated, slightly tapering

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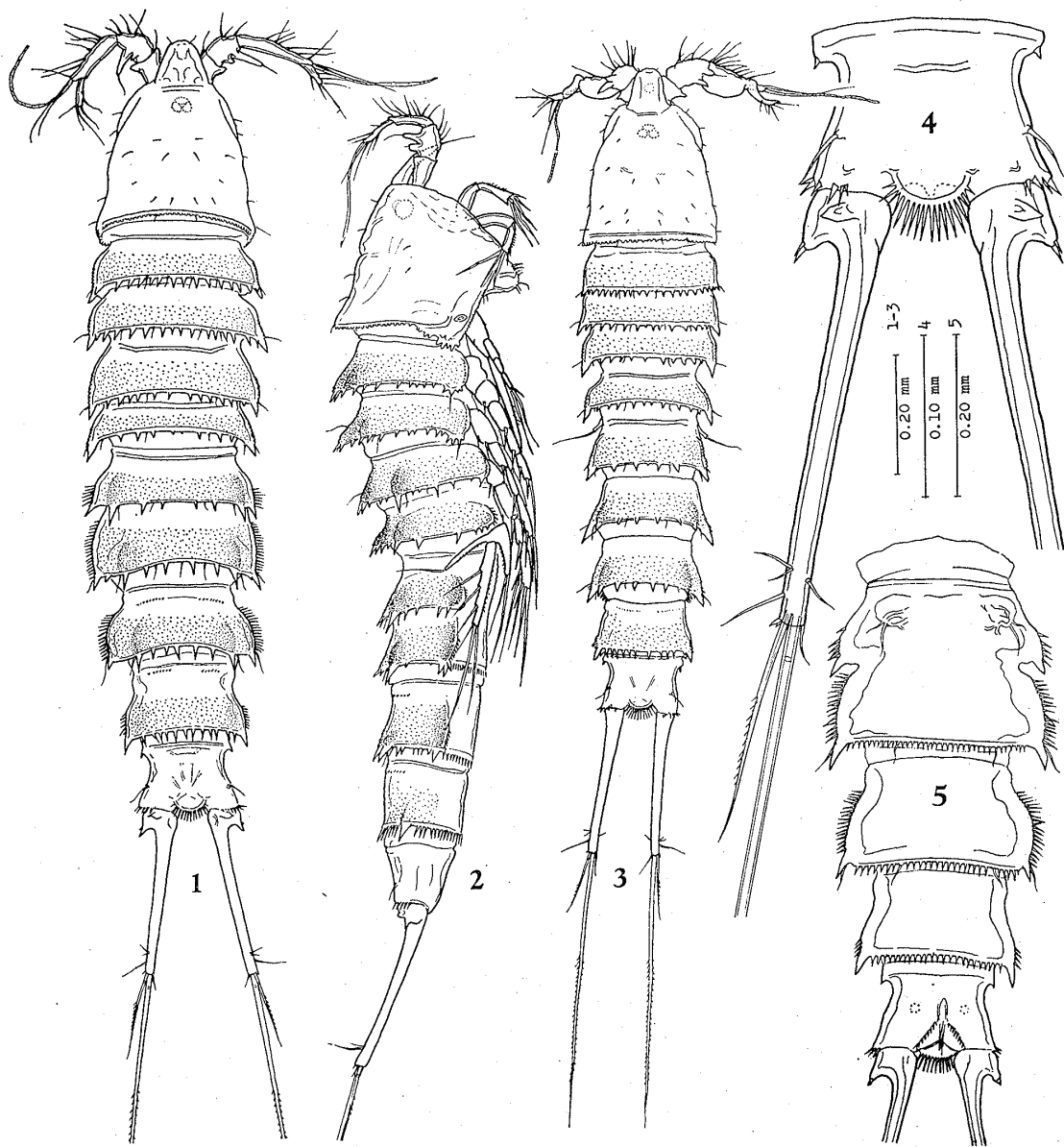


Fig. 1. *Cletopsyllus sagamiensis* n. sp.—1, ♀, dorsal; 2, ♀, lateral; 3, ♂, dorsal; 4, ♀, anal segment and furcal rami; 5, ♀, abdomen, ventral.

posteriorly. Somites clearly defined. Rostrum (Fig. 2-1) very prominent, triangular in shape, about 1.3 times as long as greatest width; a comparatively short seta on each side of bifid apical end. Cephalothorax, rostrum included, about as long as three succeeding segments combined; some delicate setae scattering on surface; a number of small corniform projections along dorsal posterior edge; both lateral hind edges serrated somewhat irregularly. Each thoracic segment furnished with some spinous formations and several hairs along posterior edge dorsally and ventrally by a chitinous stripe with some spiniform projections and

hairs; epimeral plates well-developed laterally, and fringed with many spinules; posterior ventral edge with a number of spinules. Antepenultimate somite ornamented as in the posterior division of genital double-somite. Penultimate somite with a little reduced epimeral plate, and without any hair along posterior edge; ventral edge of posterior end ornamented as in the preceding two segments. Anal segment concave laterally, a little slighter than preceding segment; a short spinous projection on each anterior lateral edge; a slender bare seta on a small projection near middle lateral edge; some spinules along outer part near posterior end and ventral edge near anus. Anal operculum (Fig. 1-4) prominent, half-round in shape, equipped with many slender spinules at margin. Furcal ramus (Fig. 1-4) well-developed, with wide basal part produced outward, 5.3 times as long as greatest width; basal part with an ear-shaped projection on dorsal surface, and a few spinules on distal corner; all setae present on and near distal end, an inner seta, articulate at base, three outer setae, two of which are juxtaposed, and three terminal setae, innermost one the shortest.

*Antennule* (Fig. 2-2) four-segmented; first segment the shortest, with some spinules and one hairy seta along anterior edge, and two spiniform projections on posterior edge; second one about 1.5 times as long as first, furnished with two strong cylindrical projections, each bearing one bare seta on apical end, and six setae, at least three of which are hairy, on and near anterior edge; third one much elongated, about twice as long as second, furnished with a long slender aesthetasc on a well-developed projection near distal edge, one bare seta on a comparatively small projection of antero-distal end, some setae along anterior edge, and posterior edge bare; fourth one slighter in appearance, with many setae, some of which are articulate at base. *Antenna* (Fig. 2-3): Coxa short. Basis about twice as long as coxa, and with some spinules along anterior edge. Exopodite much reduced, one-segmented, with two short bare setae on and near apical end. Endopodite two-segmented; first segment about twice as long as basis, and with some spinules along proximal half of anterior edge; second one a little thickened distally, three times as long as basis, with many spinules and two spines along anterior edge, five spines, three of which are geniculate and much elongate, and some minute spinules on distal end. *Mandible* (Fig. 2-4): Praecoxa with well-developed pars incisiva, bidentate lacinia mobilis, three spines and one hairy seta along cutting edge. Coxa-basis with three hairy setae on distal end, two of which are on lobules, one on each. Exopodite one-segmented, with one seta near inner proximal edge and three setae, inner two of which are juxtaposed, on distal end. Endopodite smaller than exopodite, one-segmented with one seta on apical end and some hairs along outer edge. *Maxillula* (Fig. 2-5): Arthrite of praecoxa with six spines, one bare seta and one spinulose seta along inner edge, a minute spinule on middle dorsal edge, two slender bare setae and a spinular row on surface. Coxa with a cylindrical inner projection bearing one long spine and one bare slender seta. Basis with one spinulose spine, one bare seta and some spinules on distal end, one hairy seta near end.

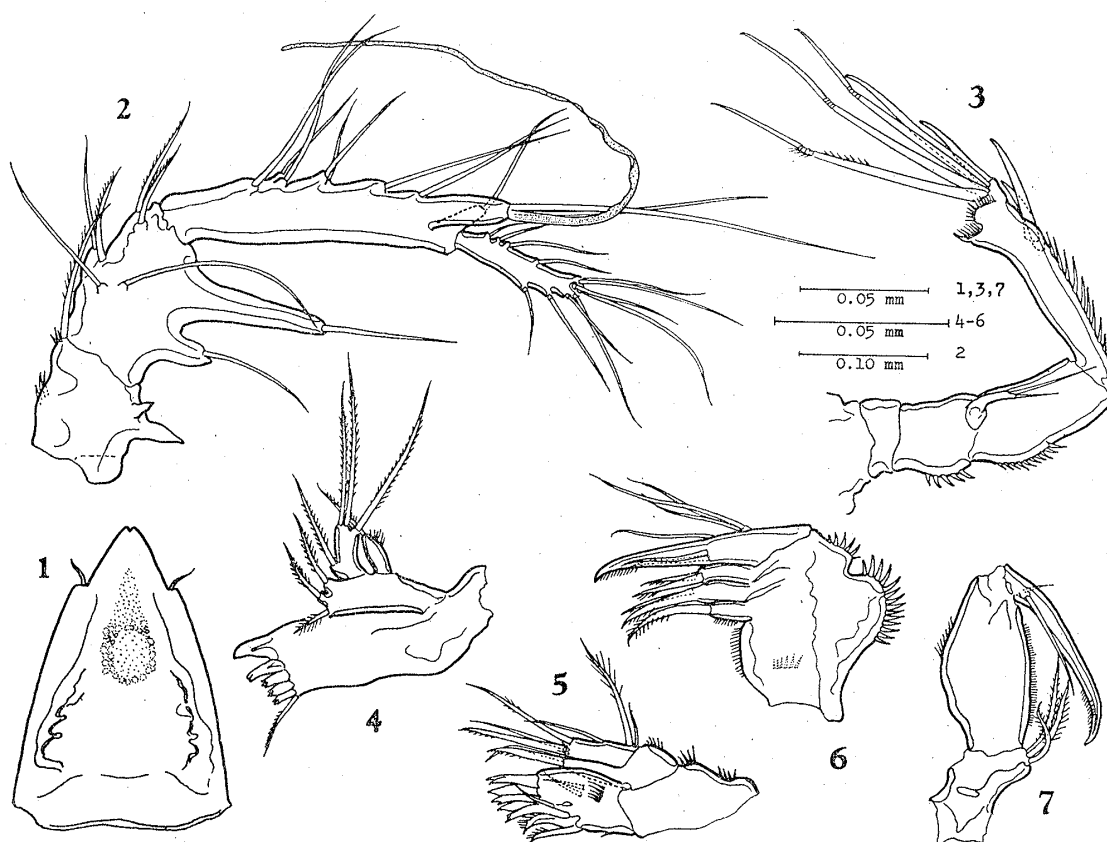


Fig. 2. *Cletopsyllus sagamiensis* n. sp.—1, ♀, rostrum; 2, ♀, antennule; 3, ♀, antenna; 4, ♀, mandible; 5, ♀, maxillula; 6, ♀, maxilla; 7, ♀, maxillipede.

Exopodite and endopodite represented by two juxtaposed setae and one seta, respectively. *Maxilla* (Fig. 2-6): Syncoxa with three endites, proximalmost one with one thick spinulose seta apically and some hairs dorsally, other endites with two setae on each apical end; outer edge bilobate, each lobe fringed with some spines, inner edge with many hairs. Basis forming one strong pectinate claw accompanied with three bare setae near base. Endopodite represented by a small segment with three juxtaposed setae. *Maxillipede* (Fig. 2-7): Basis with three spinulose setae on inner distal edge. First endopodite-segment twice as long as greatest width, with some delicate spinules along inner margin and distal half of outer edge; second segment forming a strong claw accompanied with one bare seta and one diminutive hair near base.

*Leg 1* (Fig. 3-1): Coxa with three arched spinular rows on surface; outer margin irregular in shape, with some spinules. Basis with one spinulose outer seta near base of a spinous projection; inner part of attachment of exopodite produced into a spiniform formation; inner part well-developed distally, with some spinules near distal edge and one spinulose spiniform inner seta. Exopodite three-segmented; all outer edges somewhat spinulose, some hairs on each inner edge of

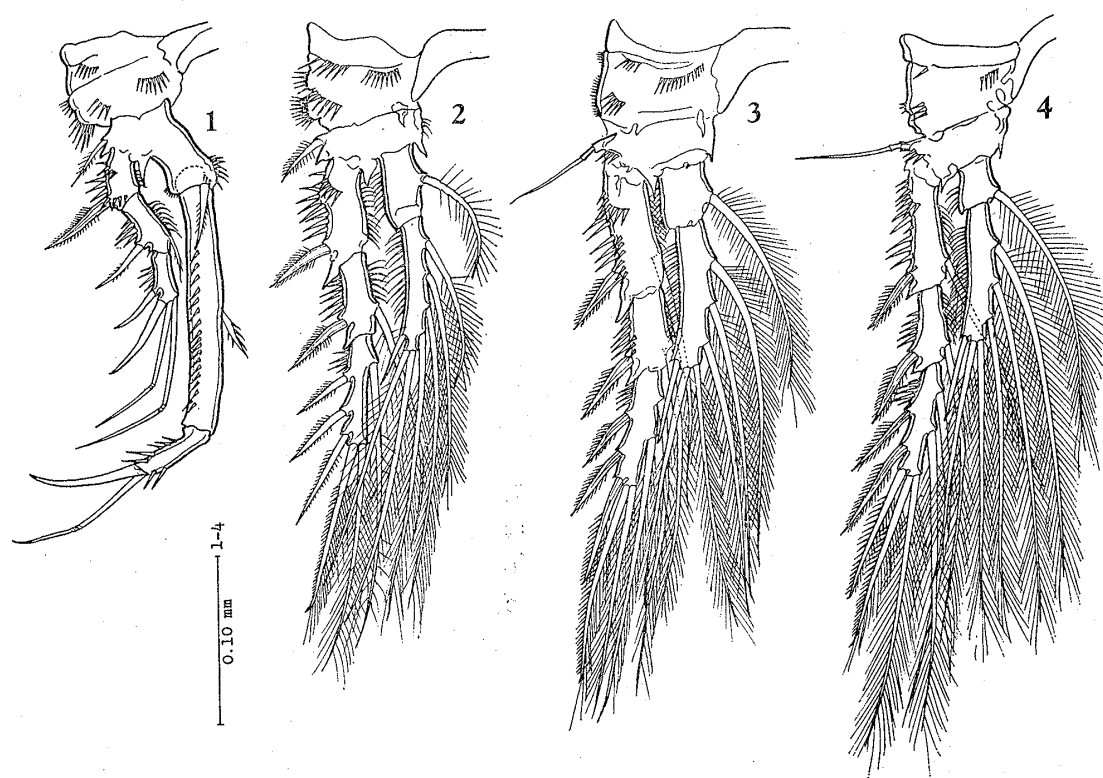


Fig. 3. *Cletopsyllus sagamiensis* n. sp.—1, ♀, leg 1; 2, ♀, leg 2; 3, ♀, leg 3; 4, ♀, leg 4.

proximal two segments; first segment with one spinulose outer spine; second one a little longer than first, with one outer spine and one hairy short inner seta; third one with one outer spine near distal end, one spine and two geniculate slender spines on distal end, inner edge bare. Endopodite two-segmented; first segment about 1.5 times as long as exopodite-segment, and seven times as long as greatest width, with one spinulose thick seta on middle inner edge, and many spinules along outer edge; second one as long as second exopodite-segment with one strong claw and one geniculate slender spine on distal end, and some spinules along outer and distal part of inner edges. *Leg 2* (Fig. 3-2). Coxa almost same as in leg 1. Basis with heavily spinulose outer seta, some delicate hairs along inner edge, with no spinular row on surface; inner distal corner forming a spiniform process. Exopodite a little slightened distally, three-segmented; first segment with one outer spine, an arched spinular row near outer edge of subproximal end, outer distal corner forming a spinous projection; second one a little shorter than first, with one outer spine, and one long inner seta; third one somewhat as long as first, with three outer spines, two terminal setae, of which outer one is spiniform, and one inner seta near subproximal edge; all spines more or less spinulose; some spinules and hairs on both margins of all segments almost same as in leg 1. Endopodite two-segmented; first segment with one hairy inner seta on middle margin; second segment slight

in appearance, about 1.8 times as long as first, reaching distal end of second exopodite-segment, with one bare outer spine on subdistal edge, two hairy terminal setae, and four hairy inner setae; outer margin of each segment hairy. *Leg 3* (Fig. 3-3): Coxa almost same as in leg 2, but outer margin straight and fringed with many delicate spinules. Basis with one slender bare outer seta on a short cylindrical process. Exopodite almost same as in leg 2 except for following structures; total length a little increased; first segment and third one with one and two inner setae, respectively. Endopodite as long as that in leg 2, second segment about 2.3 times as long as first, each segment a little wider than in leg 2. *Leg 4* (Fig. 3-4) a little slighter than leg 3 in appearance. Coxa and basis almost same as in leg 3 but with poor spinules. Exopodite and endopodite ornamented as in leg 3, but second endopodite-segment about three times as long as first. *Leg 5* (Fig. 4-1): Baso-endopodite with one long cylindrical outer process, accompanied with a spiniform formation at base, bearing one slender bare seta on distal end and some spinules along dorsal edge; inner expansion well-developed, tapering distally with three hairy inner setae, of which proximalmost one is accompanied with a diminutive seta near inner base, a bare short seta on subdistal outer edge; outer margin and basal part of inner margin densely hairy. Exopodite very slender in appearance, about nine times as long as basal width, with four outer setae, each on a lobule, one long terminal seta, and one inner seta on subdistal corner; both margins fringed with a number of very slender spinules or hairs. *Leg 6* (Fig. 1-5) represented by two bare diminutive setae on genital segment. *Genital area*: No marked structure was observed.

*Male* (Fig. 1-3). Body about 1.3 mm in length. Lateral parts of abdominal epimeral plates rather modest. Furcal ramus (Fig. 4-2) cylindrical, slightly tapering distally, about seven times as long as greatest width, and 2.5 times as long as anal segment. *Antennule* (Fig. 4-3) subchirocer, five-segmented; third segment strongly swollen. *Leg 5* (Fig. 4-4): A pair of basoendopodites forming a common plate; outer seta as in female, but without a spiniform process at base; inner expansion well-developed, reaching middle of exopodite-segment; with one hairy thick seta at inner proximal edge accompanied with a diminutive seta; one short bare seta and two spinulose thick setae on each distal and subdistal edge; outer margin hairy. Exopodite about as long as cylindrical process of outer seta on basoendopodite, with three outer, one long terminal and one inner subdistal spinulose setae; many spinules along inner and near outer margins. *Leg 6* (Fig. 4-6): A pair of legs meeting in middle, and one of a pair represented by a slight projection of ventral surface, but the other one distinctly separated from surface; each with one hairy seta on a short outer process.

*Variability*. In one male specimen, two different structures were recognized. One of a pair of basoendopodite of leg 5 was furnished with one more thick seta on the inner edge of inner expansion (Fig. 4-5), and the asymmetrical nature of a pair of leg 6 was entirely reversed on right and left (Fig. 4-7).

*Remarks*. The present new species is easily distinguishable from the species

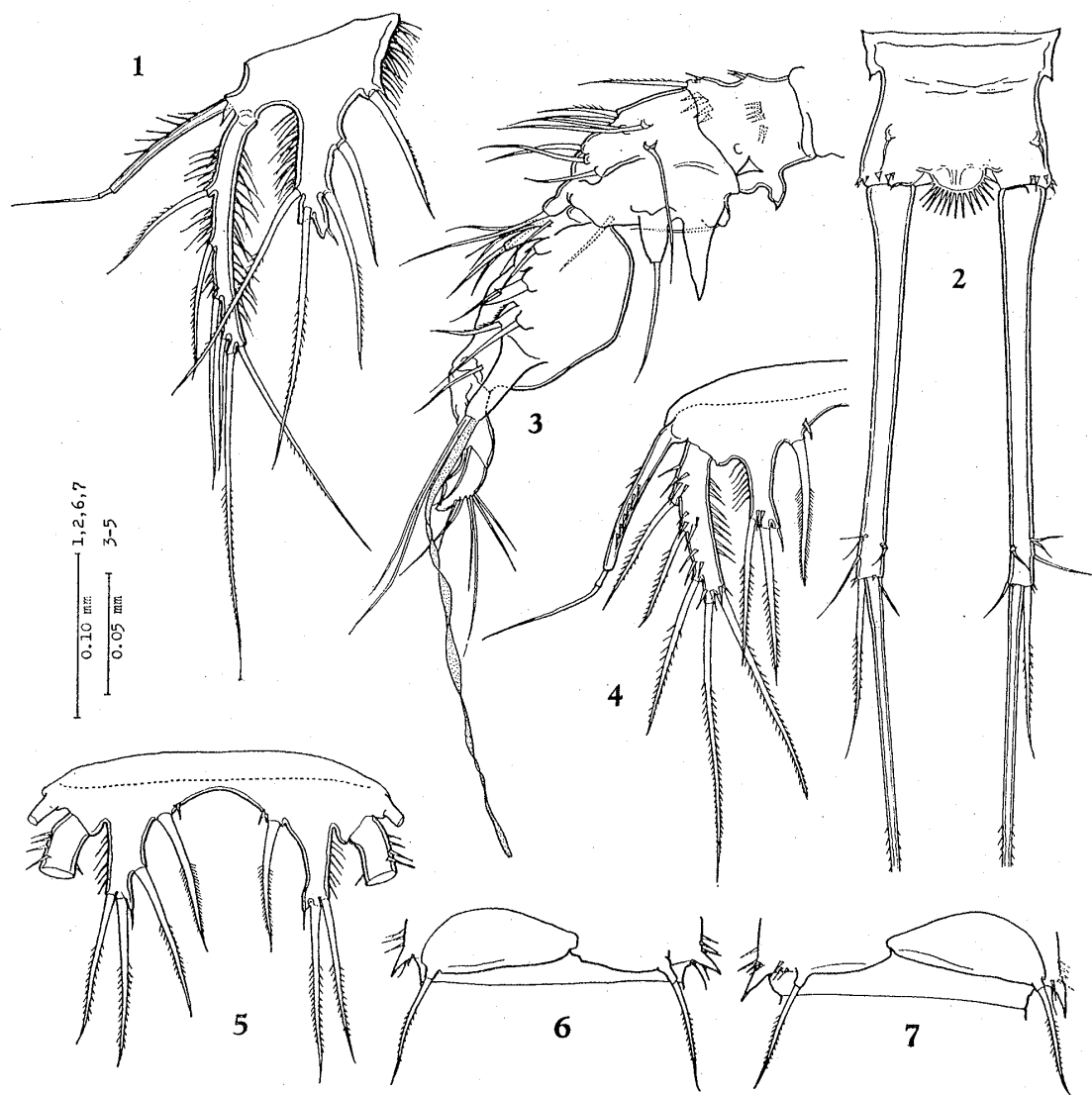


Fig. 4. *Cletopsyllus sagamiensis* n. sp.—1, ♀, leg 5; 2, ♂, abdomen and furcal rami; 3, ♂, antennule; 4, ♂, leg 5; 5, ♂, a pair of leg 5 in another specimen; 6, ♂, a pair of leg 6; 7, ♂, a pair of leg 6 in another specimen.

so far known of the genus in the unique structure of furcal rami in the female.

Several variable structures have been already described by Willey (1953) and Por (1967), in *C. papillifer* and *C. tertius*, respectively. According to the presence of some variations in those species and the present one, the species within the genus might have very variable nature at least in some structures, as in the genus *Heterolaophonte*. The structure of the furcal rami in the present new species, however, seems to be out of such variation range.

*Type-series.* Syntypes; two females, one of which is ovigerous, and three males, one of which is preserved as a total specimen. All the specimens were ob-

tained from a trundle of wool which was collected from Sagami Bay at a depth of about 80 m with the aid of a Niino's dredge (7-XII-'68).

#### ACKNOWLEDGEMENTS

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